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Journal of the Society of Arts.

FRIDAY, OCTOBER 1, 1869.

Proceedings of the Society.

MUSICAL PITCH.

The following additional information has been obtained, through the assistance of the Foreign Office, in reply to the queries issued by the Society some time since. The previous replies will be found at page 699 of the *Journal* :—

QUERIES.

1. Is there any standard musical pitch officially prescribed, and in use; and, if so, what is it, and by what number of vibrations for "C" is it represented? (It would be very desirable that a tuning-fork, or other instrument showing the pitch, should be procured and sent. The expense of this the Society will pay.

2. By what authority is it adopted, and how enforced?

3. Is it compulsory on any, and what class of musicians, and whether or not in military bands, conservatoires, operas, Royal chapels, &c.? Name these, if any.

Foreign Office, September 13th, 1869.

SIR,—With reference to your letter of the 27th July, I am directed by the Earl of Clarendon to transmit to you, for the information of the Society of Arts, copies of letters giving information respecting musical pitch in Italy, which have been sent home by Her Majesty's Chargé d'Affaires at Florence.

A tuning-fork which accompanied the report from Bologna is retained at Florence until the departure of the next messenger, and will be sent to you as soon as received.

I am, Sir,

Your most obedient, humble servant,

(Signed)

E. HAMMOND.

P. Le N. Foster, Esq., M.A., Adelphi.

FLORENCE.

(Translation).

SIR,—With reference to Sir A. Paget's note of August 11th, I renewed my application to the Minister of Public Instruction, with a view to engage him to supply me, as soon as possible, with a reply to the inquiries of the Society of Arts in England relative to musical pitch in Italy.

My honourable colleague now replies, that having desired steps to be taken accordingly in Florence, Naples, Milan, Turin, Bologna, and Venice, he has received from the authorities of Bologna, Florence, Venice, and Milan the answers sent herewith, together with a report regarding the pitch in use at Bologna drawn up by the Professor of Physics in the Royal University there.

As regards the city of Turin, information has been sought from the Musical Lyceum, the orchestra of the Royal Theatre, and the band of the National Guard, the only societies connected with music that exist there, and they have unanimously replied that they have neither adopted, nor is there prescribed officially, any fixed pitch (*diapason modello*), and that, therefore, they are unable to reply to the inquiries contained in the circular forwarded to me.

The state of things on this point is the same at Naples, where no pitch is prescribed, to regulate the vocal and instrumental orchestras of the theatres and musical establishments and societies.

The only point to note with regard to the Royal Musical College of the city and province of Naples is, that the tuning-fork or diapason which regulates the pitch of the above-named orchestras, generally speaking, is that always used at Vienna, and considered most effective, as being the sharpest, and therefore most brilliant (*più acuto e giundi più vivido*), which is proved by the perfect execution there, long since, of all sorts and kinds of musical compositions.

Such is the information that the King's government has been able to collect on the inquiries presented to it. I trust that they will serve to meet, at any rate in some measure, the wishes of the Society of Arts in England, and in this hope I avail myself, &c.,

(Signed)

A. BLANC.

September 4th, 1869.

1 and 2. There is none.

3. The musical pitch adopted in Florence is, generally, that of Vienna. The musical pitch adopted in the Royal Institute of Music is somewhat lower. In the orchestra of the Pagliano Theatre they did adopt in the last musical season, but exceptionally, the French *diapason normal*. In short, this matter, among us, is left entirely to the *bon plaisir* of every orchestra director.

(Signed)

L. F. CASAMORATA,

President of the Royal Institute of Music of Florence.

June, 1869.

BOLOGNA.

(Translation).

DEAR SIR,—I send you herewith the pitch for which you have asked. The number of vibrations has been found to be 887.77, which may be taken as 888, being only a quarter of a vibration in excess. This pitch is therefore higher than the French normal pitch by 18 vibrations, and it is rather lower than that of S. Carlo, of Naples, and much lower than that of La Scala, at Milan, as used by these theatres in 1857, when M. Lissajous examined them. To ascertain the number of vibrations, two methods have been adopted, namely, the graphic method and the acoustic method of the sirene of Cagnard de la Tour. By the first method, both my illustrious colleague, the engineer Sacchetti, and I have obtained the same results; but by the second method it was necessary that there should be an ear well practised in appreciating the sounds, so as to determine when the sirene and the note to be tried were accurately in unison. The intelligent co-operation of the very skilful professor of this Musical Lyceum, Signor Carlo Verardi, to whom I now wish to record my best thanks, has been of the greatest help to me. It is needless to add, that it has been necessary to make many experiments in both methods, in order to attain precision in the results. Much time has been required to make these experiments, and to adjust the necessary instruments. This must be my apology for the delay in replying to you.

With the greatest esteem allow me to subscribe myself,

(Signed)

LORENZA DELLA CASA,

Professor of Physics of the Bologna University.

1. No musical pitch, officially prescribed, exists at Bologna; that adopted by the orchestra of the theatre and of the Musical Lyceum, is represented by 887.77 vibrations for *La*.

2 and 3. There is no authority regulating the pitch, and consequently it is not compulsory.

MILAN.

1. At Milan there is a pitch officially adopted in the Royal Conservatoire of Music, in the theatres of La Scala and Canobbiana, in the schools of music and theatres

connected with them, and in the National Guard. This pitch is the Paris pitch, namely for *La*, 870 vibrations.

2. The authorities which regulate this pitch are, the Academical Council for the Royal Conservatoire and the Committees of the Town Council for the theatres, the schools connected with them, and their musical bands.

3. The pitch of 870 vibrations for the note *La* is compulsory on the above-named musical bodies, but without government interference.

VENICE.

1. No fixed musical pitch is prescribed in Venice; such being the case, the second part of the question requires no answer. There is, however, in the Lyceum of Marco Polo, in St. Catterina, a tuning-fork of the Paris pitch. Our orchestras adopt the musical pitch of Vienna, because the greater part of their wind instruments are made in that city.

2. As no officially-prescribed musical pitch exists, no authority regulates it; and as our orchestras have no fixed pitch, it varies according to the fancy of the director; it ought, however, to be stated that these artists endeavour to keep the pitch as low as possible.

3. The non-existence of a fixed musical pitch answers this question. However, it may be observed that the organ of the metropolitan chapel of St. Marco was formally tuned on the basis of the old *La*, very low. A few years ago it was directed to be raised, because the bowed instruments lost their fullness of tone, and the wind instruments manufactured in Vienna were not in tune with it; now, this organ is tuned a quarter of a tone lower, but still it is higher than the normal French pitch. The other organs are tuned according to the fancy of the builders. Modern builders generally adopt the Vienna pitch in preference to that of Paris. There is no authority which regulates the pitch in bands of the army and the National Guards.

(Signed) GIOVANNI LAZZARI
(Formerly President of the Fernie Theatre).
ANTONIO BUZZELLI.
FRANCESCO TESSARINI.
CÉSARE TROMBINI.

Venice, 16th June, 1869.

Proceedings of Institutions.

EXAMINATION PAPERS, 1869.

(Continued from page 832.)

The following are the Examination Papers set in the various subjects at the Final Examination held in April last :—

LATIN AND ROMAN HISTORY.

THREE HOURS ALLOWED.

SECTION I.

Translate :—

'Vincis,' ait 'Perseu. remove fera monstra, tuasque Saxificos vultus, quaecumque ea, tolle Medusae : Tolle, precor. Non nos odium rognivo cupido Compulit ad bellum. pro coniuge movimus arma. Causa fuit meritis melior tua, tempore nostra. Non cessasse piget. Nihil, o fortissime, praeter Hanc animam concedo mihi. tua cetera sunt.' Talia dicenti neque cum, quem voce rogabat, Respiciere audenti 'Quod' ait 'timidissime Phineu, Et possum tribuisse, et magnum est munus incerti, Pone etiam, tribuam. nullo violabere ferro. Quin etiam mansura dabo monumenta per aevum : Inque domo soceri semper spectabere nostri, Ut mea se sponsi soletur imagine coniunx.' Dixit. et in partum Phoreynida transtulit illam, Ad quam se trepido Phineus obverterat ore.

Tum quoque conanti sua vertere lumina cervix

Deriguit, saxoque oculorum induruit humor.

Sed tamen os timidum, vultusque in marmore supplex, Summissaeque manus, faciesque obnoxia mansit.

1. Parse fully, giving both accident and syntax, the words vultus, meritis, dicenti, respiciere, quod, conanti.

2. Give the present and perfect tenses indicative and the supines of the verbs remove, tolle, cessasse, induruit, mansit.

SECTION II.

Translate :—

Quas dea per terras et quas erraverit undas, Dicere longa mora est. Quaerenti defuit orbis. Sicaniam repetit. Dumque omnia lustrat eundo, Venit et ad Cyanen. Ea ni mutata fuisset, Omnia narrasset. sed et os et lingua volenti Dicere non aderant, nec quo loqueretur, habebat. Signa tamen manifesta dedit, notamque parenti, Illo forte loco delapsam in gurgite sacro, Persephones zonam summis ostendit in undis. Quam simul agnovit, tamquam tunc denique raptam Scisset, inornatos laniavit diva capillos, Et repetita suis percussit pectora palmis, Nescit adhuc, ubi sit. terras tamen increpat omnes Ingratasque vocat nec frugum munere dignas : Trinacriam ante alias, in qua vestigia damni Repperit. Ergo illic saeva vertentia glebas Fregit atrata manu, parilique irata colonos Ruricolaeque boves leto dedit, arvaque iussit Fallere depositum, vitataque semina fecit.

1. Account for the mood of the verbs erraverit, narrasset, loqueretur, scisset, sit, fallere.

2. What is the precise difference between is, hic, ille, iste ?

3. Account for the case of quaerenti, volenti, munere, manu, leto.

SECTION III.

Translate :—

At enim te in disciplinam meam tradideras—nam ita dixisti—; domum meam ventitaras. ne tu, si id fecisses, melius famae, melius pudicitiae tuae consuluisse. sed neque fecisti nec, si cuperes, tibi id per C. Curionem facere licuisset. auguratus petitionem mihi te concessisse dixisti. o incredibilem audaciam ! o impudentiam praedicandam ! quo enim tempore me augurem a toto conlegio expetitum Cn. Pompeius et Q. Hortensius nominaverunt—nec enim licebat a pluribus nominari—tu nec solvendo eras nec te ullo modo nisi eversa re publica fore incolumem putabas. poteras autem eo tempore auguratum petere, cum in Italia C. Curio non esset ? aut tum, cum es factus, unam tribum sine Curione ferre potuisses ? cuius etiam familiares de vi condemnati sunt, quod tui nimis studiosi fuissent.

1. Parse fully, giving both accident and syntax, the words domum, fama, audaciam, solvendo, tui.

2. Account for the mood of consuluisse, fore, esset, potuisses, fuissent. What difference would be made in the meaning if the last word had been fuerant ?

SECTION IV.

Translate :—

Hereditates mihi negasti venire. utinam hoc tuum verum crimen esset ? plures amici mei et necessarii viverent. sed qui istuc tibi venit in mentem ? ego enim amplius H.S. ducenties acceptum hereditatibus rettuli. quamquam in hoc genere fateor feliciorum esse te : me nemo nisi amicus fecit heredem, ut cum illo commodo, si quod erat, animi quidam dolor iungeretur ; te is, quem tu vidisti numquam, L. Rubrius Casinas fecit heredem. et quidem vido quam te amarit is, qui albus aeternae fuerit ignoras : fratris filium praeteriit : Q. Fufii, honestissimi equitis Romani suiique amicissimi, quem palam heredem semper factitavit, ne nomen quidem perscripsit : te, quem numquam viderat aut certe numquam salutaverat, fecit heredem. velim mihi dicas, nisi molestum est, L. Turselius qua facie fuerit, qua statura, quo municipio, qua tribu.

'nihil scio' inquit 'nisi quae praedia habuerit.' *is* igitur fratrem exheredans te faciebat heredem. in multas praeterea pecunias alienissimum hominum vi electis veris heredibus, tamquam heres esset, invasit. quamquam hoc maxime admiratus sum, mentionem te hereditatum auum esse facere, cum ipse hereditatem patris non adisses.

1. Explain H.S. ducenties. How did the Romans commonly express sums of money?

2. Account for the mood of *viverent*, *jungeretur*, *fueries*, *dicas*, *adisses*.

3. Account for the case of *tibi*, *sui*, *facie*, *heredibus*, *hereditatum*.

SECTION V.

1. What was a Roman colonia?

2. Give an account of the league made by Spurius Cassius with the Latins and the Hernici.

3. Write a short life of Camillus.

4. What was the military tribunate? How long did the institution last?

5. Mention the occasions on which Rome was in trouble because a large proportion of the citizens were in debt, and what was done on each occasion.

6. What were the Licinian laws? and what was their purpose?

SECTION VI.

1. What caused the second Punic War? To what causes do you attribute the success of Rome in that war?

2. Mention any very distinguished censors, and what made them distinguished.

3. Describe the suppression of Catiline's conspiracy, and its consequences.

4. Give an account of the Gracchi.

5. Describe the Roman government of the provinces.

6. Give an account of Mithridates.

FRENCH.

THREE HOURS ALLOWED.

PART I.

Candidates for a third-class certificate are to translate the following extract into English, and to answer the grammatical questions thereto annexed, in the order in which they are placed. This first part is all that is required of them.

Il y a une grande puissance de conviction et de dévouement à l'idée, dans cette lutte d'un seul contre une multitude. Braver à la fois, sans autre parti que sa raison individuelle, le respect humain, cette lâcheté de l'esprit déguisée en respect de l'erreur; affronter les haines de la terre et les anathèmes de l'Eglise, ce fut l'héroïsme de Voltaire. Il exposa son nom; il le dévoua, et pendant sa vie et après sa mort. Il se résigna à de longs exils en échange de la liberté de combattre. Il se séquestra volontairement des hommes pour que leur pression ne gênât pas en lui sa pensée. A quatre-vingts ans, infirme et se sentant mourir, il fit plusieurs fois ses préparatifs, à la hâte, pour aller combattre encore et expirer loin du toit de sa vieillesse. La verve intarissable de son esprit ne se glaça pas un seul moment. Il porta la gaieté jusqu'au génie, et sous cette plaisanterie de toute sa vie on sent une puissance sérieuse de persévérance et de conviction. Ce fut le caractère de ce grand homme. La verve lumineuse de sa pensée a trop caché la profondeur du dessein. Sous la plaisanterie et sous le rire, on n'a pas assez reconnu la constance. Il souffrait en riant et voulait souffrir, dans l'absence de sa patrie, dans ses amitiés perdues, dans son nom flétri, dans sa mémoire maudite. Il accepta tout en vue du triomphe de l'indépendance de la raison humaine. Le dévouement ne change point de valeur en changeant de cause; ce fut là sa vertu devant la postérité. Il ne fut pas la vérité, mais il fut son précurseur, et marcha devant elle. Une chose lui manqua: ce fut l'amour de Dieu. Il le voyait par l'esprit, il haïssait les formes que les âges passés lui avaient associées et adoraient à sa place. Il déchirait

avec colère les nuages qui dans sa conviction empêchaient l'idée divine de rayonner sur les hommes, mais son culte était plutôt de la haine contre l'erreur que de la foi dans la divinité. Le sentiment religieux, ce résumé sublime de la pensée humaine, cette raison qui s'allume par l'enthousiasme pour monter à Dieu comme une flamme et pour se réunir à lui dans l'unité de la création avec le créateur, du rayon avec le foyer, Voltaire ne le nourrissait pas dans son âme. De là les résultats de sa philosophie. Elle ne créa ni morale, ni culte, ni charité; elle ne fit que décomposer et détruire. Négation froide, corrosive et railleuse, elle agissait à la façon du poison, elle glaçait, elle tuait; elle ne vivifiait pas. Aussi ne produisit-elle pas, même contre ces erreurs, qui n'étaient que l'alliage humain d'une pensée divine, tout l'effet qu'elle devait produire. Elle fit des sceptiques au lieu de faire des croyants. La réaction chrétienne fut prompte et générale. Il en devait être ainsi. L'impiété vide l'âme de ses erreurs sacrées, mais elle ne remplit pas le cœur de l'homme. Jamais l'impiété seule ne ruinera un culte. Il faut une foi pour remplacer une foi. Il n'est pas donné à l'irréligion de détruire une religion sur la terre. Il n'y a qu'une religion plus lumineuse qui puisse véritablement triompher d'une religion altérée en la remplaçant. La terre ne peut pas rester sans autel.

LAMARTINE.—*Les Girondins*.

1. Parse the first two sentences of the above extract, down to "de Voltaire".

2. Give the five primitive tenses of the verbs:—*Mourir*, *fit*, *aller*, *combattre*, *sent*, *reconnu*, *souffrait*, *riant*, *voulait*, *voyait*, *nourrissait*, *détruire*, *produisit*, *devait*, *puisse*.

3. Write the masculine form of the adjectives *corrosive*, *railleuse*, *lumineuse*, and write the feminine of *frats*, *gros*, *vieux*, *sec*, *favori*.

4. The *h* is mute in "l'héroïsme." Is it the same in "héros," "héroïne," "héroïque"?

5. "A de longs exils." Explain the use of "de" here, and give all the meanings of that word.

6. "A quatre-vingts ans." When is "vingt" thus spelt with an *s*?

7. "Glaça," "changeant." Explain the rules which refer to the peculiar spelling of these two words.

8. "Il haïssait." Give the forms of the verb "haïr," in which the *i* does not require the "tréma," as in the present case.

9. Explain the spelling of both past participles in "les formes que les âges passés lui avaient associées."

10. "Aussi ne produisit-elle pas." What are the other words, adverbs or conjunctions, with which the verb is thus placed before its nominative case, although the sentence is not interrogative? Give examples.

11. How do you explain the subjunctive "puisse" in the last sentence but one?

12. Distinguish between *volontairement* (5th sentence) and *volontiers*; and also between *il voulait souffrir* (12th sentence) and *il voulait bien souffrir*.

13. The word "parti" that occurs in the second sentence has several meanings, totally different; can you give them with examples?

14. Conjugate the preterite and the present subjunctive of the verbs:—*Créer*, *détruire*, *rire*, *vouloir*, *souffrir*, *haïr*, *devoir*.

PART II.

Candidates for a second-class certificate are to answer questions 9 and 11 in Part I, together with those in Part II, and to translate the English extract and idiomatic expressions which follow.

Grammatical and Idiomatic Questions.

1. Decline the French personal pronouns of both genders, giving the disjunctive or analytical, and the conjunctive or synthetical forms in each case.

2. When do the dative pronouns *lui*, *leur*, and the accusative *le*, *la*, *les*, follow the verb instead of preceding it, according to the general rule? Give examples.

3. Show with examples how personal pronouns are

construed in the disjunctive form for the sake of contra-distinction.

4. Show also by examples the construction of pronouns with reciprocal verbs. Translate "they will hurt each other" and "they will write to each other," 1st, in speaking of two persons, 2nd, in speaking of more than two.

5. Name the substantive that corresponds to each of these adjectives, which occur in the French extract:—*Lumineuse, sublime, humaine, froide, corrosive, railleuse, sceptique, chrétienne, prompte*, and also to each of the past participles—*Déguisée, perdues, flétri, maudite*.

6. Give all the meanings of the verb *manquer*, with examples.

7. Contrast the pronunciation of the following French words with that of the words exactly corresponding to them, and all but identically the same in English:—*Subtil, calme, sculpteur, sceptique, schisme, hérésie, observer, posséder, baptême, baptiser, psaume, psalmiste, phthisie*. Add any others you may think of, presenting a like contrast in the two languages.

8. Explain by the affinity of sounds how the *v* of *cheval* and the *j* of *jeter* are respectively affected and modified, when the *e* mute being dropped each of these words is pronounced like a monosyllable.

9. Conspicuous among the many English misspellings of words or locutions borrowed from the French, may be noticed *côte* *qui cote*, and the *morale* (of troops, &c.). Correct and explain.

Translation.

The pretty fable by which the Duchess of Orleans illustrated the character of her son, the Regent, might, with little change, be applied to Byron. All the fairies, save one, had been bidden to his cradle. All the gossips had been profuse with their gifts. One had bestowed nobility, another genius, a third beauty. The malignant elf who had been uninvited came last, and unable to reverse what her sisters had done for their favourite, had mixed up a curse with every blessing. In the rank of Lord Byron, in his understanding, in his character, in his very person, there was a strange union of opposite extremes. He was born to all that men covet and admire. But in every one of those eminent advantages which he possessed over others was mingled something of misery and debasement. He was sprung from a house, ancient indeed and noble, but degraded and impoverished by a series of crimes and follies which had attained a scandalous publicity. The kinsman whom he succeeded had died poor, and but for merciful judges would have died upon the gallows. The young peer had great intellectual powers; yet there was an unsound part in his mind. He had naturally a generous and feeling heart, but his temper was wayward and irritable. He had a head which statuary loved to copy, and a foot the deformity of which the beggars in the streets mimicked. Distinguished at once by the strength and by the weakness of his intellect; affectionate, yet perverse; a poor lord and a handsome cripple, he required, if ever man required, the firmest and most judicious training.

MACAULAY.—*Essays*.

Idioms.

Il est fait à cela. Il est fait pour cela.
Je me le suis assuré. Je m'en suis assuré.
Rendez-vous. Rendez-vous y.
Il n'y reviendra pas. Il n'en reviendra pas.
Vous en revenez toujours là.
Il en est revenu d'une belle.
Que vous en reviendra-t-il? A combien cela vous reviendra-t-il?
Il en faut peu. Il s'en faut peu.
Il s'y trouve bien. Il s'en trouve bien.
Elle prend l'air. Elle prend des airs.

PART III.

Candidates for a first-class certificate are expected to

translate the above idioms and English extracts, and to answer in French the last seven questions in Part II., as also the following:—

Literature.

1. Describe the character of Villon's writings, and comment on Boileau's lines—

Villon sut le premier, dans ces siècles grossiers,
Débrouiller l'art confus de nos vieux romanciers.

2. State what you know of the *Heptaméron*.

History.

Sketch briefly the part taken by France in the Crusades.

(To be continued.)

PARIS CONSERVATOIRE DES ARTS ET METIERS.

The following account of the Conservatoire des Arts et Métiers, and the Central College in Paris, taken from the *Builder*, is worthy of attention at the present time:—

"The Imperial Conservatory of Arts and Trades, or, as it is styled in French, the "Conservatoire des Arts et Métiers," is the oldest establishment for affording technical instruction in France. It owes its origin to a mechanical genius, Vaucanson, who, during his life-time, was apparently frittering away his talents in contriving complicated pieces of automata, which nevertheless formed the delight of those who had an opportunity of seeing these triumphs of mechanical skill.

"Vaucanson constructed, among other things, an automaton flute-player, which executed several airs in a charming way; and a duck which waddled in the water, arranged its plumage, picked up its food, and apparently digested it; together with other ingenious imitations of the natural habits of the bird.

"These, however, were but the playthings of a great man, and Vaucanson, while he lived, did much that was of service to his country, and at his death he bequeathed his valuable collection of looms and other machines to the government, for the free use of artisans, native and foreign. The government accepted the gift, and placed the collection in a building which was open to all. The collection was enlarged, and, just as the great French revolution burst over France, the institution had become an important aid to the mechanic. During the early, tempestuous days of the revolution, the Conservatory was at first neglected, and then shut up. But the period of its vicissitudes was short, and in a very little time the institution resumed its teaching. In 1796, a drawing-school was established. This was an era in the records of technical instruction in France, for until this time no establishment for the teaching of drawing applied to industry, and based upon descriptive geometry, was to be found in the country. From this school, as the government report assures us, proceeded a number of pupils who, in various ways, became useful to their country, as well as several eminent manufacturers.

"In 1810, the Continental blockade, devised by Napoleon to strike a death-blow at English manufacturing industry, was in full operation, and the importation of English cotton goods was almost entirely prevented. This condition of affairs gave rise to the establishment of a spinning-school at the Conservatory. Looms were set up, and a sufficient number of workmen were trained to give an impulse to the weaving trade of France. This school did not long continue in operation; the weavers found employment in private manufactories, after which the establishment was closed, as being of a character foreign to the general nature of the Conservatory.

"With the exception of this temporary educational workshop and the elementary drawing-school, the only object of the Conservatory, down to this date, was the formation of a collection of machines, looms, and apparatus employed in the industrial arts. Its scope was much widened in consequence of a decree of 1819. Prior to

this, the Conservatory merely offered to industry a mute museum, from which the manufacturer or artisan might doubtless derive useful instruction; but this instruction was unaccompanied by the teaching of the principles which should form its foundation.

"In December of the latter year, an important step was taken. There was established a public and gratuitous course of instruction on the application of the sciences to the industrial arts. Here, indeed, was an immense stride, the consequences of which are everywhere to be witnessed in France at the present day. A decree of 1829 added fresh popularity to the Conservatory, by the inauguration of a course of physics as applied to the arts. In 1836, three more additions were made. These were—a course of cultivation, a course of mechanics and buildings applied to agriculture, and a course of agricultural chemistry. There were now seven courses in full operation. But these were still insufficient for the increasing development of industry, as well as for the general demand for more scientific instruction. In prompt obedience to this demand, an enlightened French ministry decreed five new public and gratuitous courses. They were—a course of mechanics applied to industry, a course of descriptive geometry, a course of law as applied to industry, a course of chemistry applied to the arts, and a course of agriculture, to which the previously existing course of cultivation was added as a second course. Thus the number of courses was raised to ten. In 1848, a course of ceramics was opened by M. Ebelman, director of the Sèvres government porcelain manufactory; but at his death the lectures were discontinued. Many improvements were also suggested at this period, but were delayed in consequence of the political condition of France during 1848 and subsequently. The foundation of new courses recommenced in the year 1852, with the establishment, at the instance of the Paris Chamber of Commerce, of a course of spinning and weaving, and a course of dyeing, printing, and dressing of tissues. In the same year, a course of zoology applied to agriculture and industry was opened. A course of civil architecture was founded in 1854. At this period, the number of gratuitous public courses in the applied sciences had reached the number of fourteen. But the augmented advantages of the Conservatory were not restricted to oral teaching; the collection of models and machines was enlarged, classified, and in every way improved. Since 1849, a catalogue had been in existence; but now every object exhibited was accompanied by a card explanatory of its use. Projected in 1849, and at the present time in full operation, is a gallery for experiments, and for machines in motion. This department has an important office to perform. It is used for trying, either at the demand of the different ministries, or of private manufacturers, any new machines or apparatus presented for examination. These experiments have been received with great satisfaction, and reports of them have been published by the Conservatory. The experiments are made gratuitously. The Conservatory also undertakes the verification of the standard weights and measures required by those foreign governments which have adopted the French metrical system.

"The collections of models are estimated to be worth 1,300,000 francs, or £52,000 of our money. The library contains 18,000 works on the sciences and industrial arts. In the gallery of drawings there are upwards of 7,000 designs of the newest and most useful machines, to scale, and with dimensions given. There is likewise a collection of expired patents. As early as the Exhibition of 1851, the industrial artists of France were, according to their own confession, alarmed at the strenuous efforts England was beginning to make to dispute with them the empire of taste. From this feeling arose the demand made by the industrial interest for increased facilities in art-teaching. The director of the conservatory addressed a memorial upon the subject to the Emperor. There are two characteristic paragraphs in this memorial, dated 1854, which we will

translate. They show that our indifference to what is going on upon the Continent respecting the teaching of science and art is not shared by the foreigner, who, as a matter of fact, has been closely watching all our efforts at improvement in technical instruction. The first paragraph says:—"The Universal Exhibition of London has proved to England the superiority of France in the arts dependent on form, taste, and colour. Instead of disputing the fact, the English have set to work at once, with their immense resources and habitual energy, to found museums and drawing-schools all over the country. The Queen and private individuals have stripped their galleries to enrich the museums of practical art with the finest specimens of Sèvres porcelain, bronzes, sculptures, &c."

"The second paragraph is still more characteristically French:—"It would seem as if the English were bent on operating on the human species in the way they have upon races of animals, so as to transform a nation of traders and artisans into a nation of men of taste. How far the Anglo-Saxon race is susceptible of this transformation is a philosophical question beyond my province; but one thing is certain—namely, that a few years hence England will have made immense progress in the arts of design."

"To return to the Conservatory. According to the yearly reports addressed to the Minister of Agriculture, Commerce, and Public Works, the number of persons attending the public courses of the Conservatory is constantly increasing. In six months it has reached 180,000 persons. The great amphitheatre of the institution will accommodate 700 persons; the smaller one 300 persons; and both are found too small.

"When the courses were first started, Sunday was the day which the public appeared to prefer. Gradually, however, the week-day evenings came into favour.

"The teaching so freely given at the Conservatory is exclusively devoted to science applied to industry. The audience is for the most part composed of foremen, workmen who have already received some instruction, and apprentices. There are also a few foreign professors, and many persons who take an interest in the progress of technology. As we have seen, these public courses are gratuitous, and are open to both natives and foreigners. The teaching of this institution is so constantly kept on a level with all the improvements continually being made in France, England, and elsewhere, that the courses are attended by a great number of young foreigners, whose intention it is to become professors.

"The special influences which this institution brings to bear upon the progress of science applied to industry, may be thus summarised:—The collection of models, machines, and products; lectures on science relating to industry, and upon industrial arts; a gallery of drawings which the public are permitted to copy; and an elementary school. The sum at present voted for its maintenance is 285,500 francs a year.

"The Conservatory of Arts and Trades is situate in the Rue St. Martin, and the visitor to Paris may go over it on any Sunday or Thursday free; on other days he would have to pay a franc.

"The Central Imperial School of Arts and Manufactures is a highly esteemed and most important educational establishment, and has been already described at some length in our pages. By its means many pupils who cannot avail themselves of the opportunities offered by the great Polytechnic School, are enabled to obtain a most complete and practical education.

"For the purpose of comparison, we will give a short sketch of the Polytechnic School. It was founded in the year three of the Convention (1794), for the instruction of young men in mathematics and drawing, for the artillery and engineer corps. None but candidates who can pass a very severe examination in mathematics are admitted. Its effort has always been to educate, above all things, good engineers; and some of the most cele-

brated military and civil engineers have been bred within its walls. Still, the time required by this school (seven years), including the preparatory and complementary studies, is much too long for candidates who are anxious to commence their practical and money-earning career as soon as possible. The difficult preliminary examination also includes a great number of candidates. Again, more than half the pupils of the Polytechnic School choose the military service, whilst the greater portion of the other half abandon the civil services to follow scientific pursuits. This is why the admirable Polytechnic School has never been able to satisfy the ever-increasing demands of industry.

"The Central School, therefore, fills up a manifest deficiency in the French system of technical instruction. It was founded in 1829, by the celebrated chemist Dumas, assisted by three other gentlemen, without any aid from the government; but, after some years of success, it first of all passed into the hands of a proprietor, and was then transferred to the State. In the Central School have been educated a considerable number of able engineers, who have taken high rank as constructors of railways, &c. Many directors, managers, and other functionaries of important industrial establishments, civil engineers, mechanical engineers, architects, &c., have emanated from this school.

"The Central School is very popular, even with persons of narrow means, though what in France is held to be a high charge (800 francs, £32 a year) is demanded from pupils. The government and several of the departments have founded scholarships, in favour of the sons of parents in very humble circumstances, and in some cases money for board and lodging has been added. The sons of rich parents pay for their education, as they naturally ought; whilst the doors of the school are also open for the sons of artisans who have given proof of the talents necessary to profit by the instruction.

"At the Central School the pupils are compelled, whatever may be the career they intend to follow, to attend all the courses, and to pass very strict and frequent examinations. During the first year, the instruction is purely theoretical. In the second and third years, theory and practice are blended. The teaching is not confined to unaided oral instruction, for laboratory experiments, and mineralogical and geological excursions are made use of, to complete what the lectures of the professors have commenced. As we have stated, there are frequent compulsory examinations during the courses and at their close, in addition to which there are searching examinations at the termination of each year's studies. The effect of this system is to keep the pupils always up to their work. Discipline is also strictly maintained.

"The Central School is quite international and cosmopolitan in its character; pupils of all nations are admitted on the same footing as natives of France. Not a country in Europe is without a representative, and, at one time or another, pupils have come here from every part of the civilised globe."

Lest it should be thought from the expression "that there is likewise a collection of expired patents," that patents are represented in the Conservatoire, it may be mentioned that such models of patents are not shown publicly, but are kept in a small garret covered with dust, and rarely, if ever, consulted. It is no better than a collection of old mouse-traps, hand lanterns, old shoes, sabots, corkscrews, and the like, of no practical value.

PARKS, GARDENS, AND PROMENADES OF PARIS.

The changes that have taken place in Paris during the last few years form altogether the most extraordinary amount of work that any municipal government ever caused to be executed in the same space of time in an old city; broad boulevards have replaced narrow and tortuous streets, and pierced masses of dwellings

rotting with age and reeking with poisonous emanations. The refuse of the city has been collected by means of a grand system of sewers, and the Seine freed, or nearly so, from all pollution; at the same time, the decoration of the city has been unceasingly pursued; old parks have been beautified and new ones formed, public gardens have been laid out in every quarter of the city, in broad places around public monuments, and in one case in connection with a church—an innovation that has called forth much criticism—and all the great thoroughfares of the city have been planted with trees which, if they do not yet afford much shade, relieve the somewhat monotonous effect of the long lines of white stone houses most agreeably.

The work of the landscape gardener and florist has been no sinecure; in many cases everything was wanting, not only trees and flowers but soil and water, and considering the difficulties of the case the effect that has been achieved is certainly marvellous. How all this has been done, the methods adopted, the costs incurred, and the successes achieved, are now being made known to the world by M. A. Alphand, of the Imperial Corps of Engineers of Roads and Bridges, and Director of the Public Ways and Promenades of the City of Paris, in a publication which in the magnificence of its typography and illustrations has few rivals.* The work will, when completed, form one volume of text and one of illustrations, and it is issued in parts, more than half of which have already appeared. M. A. Alphand naturally commences with his eldest, which is at the same time his most beautiful child, the Bois de Boulogne; after this come Vincennes, the new parks and gardens, the Champs Elysées, the park and garden of the late Universal Exhibition, now completely obliterated, twenty squares, the boulevards, places, fountains, and cemeteries, with a special chapter on the garden of the city of Paris, the floral manufactory where all the decorations of the flower-beds are reared, and where, in the chilly months, the less hardy kinds find a comfortable home.

The work includes everything connected with the subject, the formation of roads, sewers, and conduits, the supply of water, and methods of irrigation, the transplanting of trees, production and distribution of flowers, lodges, restaurants, railings, gates, candelabra, lamps, and useful and decorative objects of all kinds; and in each case the cost of the work, and of the keeping of the various parts in condition, are given, so as to render the book especially valuable to all those who are entrusted with the surveillance or execution of public parks, gardens, and promenades, as well as to landed proprietors.

The Bois de Boulogne is the last remaining portion of the great forest of Rouvray, where Dagobert is said frequently to have hunted; in the twelfth century it lost its old name, and was called the Bois de St. Cloud. The present name originated in the following manner:—Some pilgrims in 1319 erected, in a small hamlet, then called Menu-les-St. Cloud, a church, in imitation of that of Boulogne-sur-Mer. The hamlet was then called Boulogne, and the wood took the same title. The Abbey of Longchamps, the châteaux of Madrid, La Muette, Ranelagh, and Bagatelle, all appertaining to the Bois, are pregnant with historical recollections, dating from the time of Francis I. to that of Louis XVI., but our business is with its recent history.

At the fall of the first Empire nearly the whole of the old timber in the Bois was destroyed, and during the reign of Louis Philippe a great deal of labour was bestowed upon its plantations and roads, but in 1841 it suffered serious diminution by the construction of the fortifications, which cut off Ranelagh and considerable tracts of land on the Passy and Auteuil sides.

In 1852 the Bois de Boulogne was transferred from

* "Les Promenades de Paris, Bois de Boulogne, and de Vincennes, Parks, Squares, Boulevards," par A. Alphand, &c., illustrated by chromolithography and engravings on steel and wood, from designs by E. Hochereau, Inspector of the Promenades of Paris, &c. Large folio. Paris, J. Rothschild; London, R. Hardwicke.

the State to the care of the city of Paris, which was bound to execute within four years embellishments to the extent of £80,000, and in the following year the two lakes were formed, and the new roads and plantations commenced. The success which attended these operations determined the complete transformation of the Bois, and for this purpose a large tract of land on the banks of the Seine, three miles in length and of considerable width, was included in the Bois, the cost of the purchase of this land being partly covered by the letting of certain detached portions for building, and by the establishment of the hippodrome or racecourse on the plains of Longchamps. The Bois was then enclosed by means of a ha-ha ditch and iron railings, with seventeen pairs of gates.

Before the Bois could be completely planted and laid out in grass there was much to be done, for a considerable portion of the lands near the river were liable to be flooded at every high tide by an old arm of the Seine, which had to be filled up. These and other works occupied five years.

The whole extent of the Bois is upwards of two thousand acres, of which about one half is in plantations, a quarter under grass, and the remainder occupied by water and roads.

The lakes and rivulets contain nearly two hundred thousand tons of water; and the maximum quantity dispensed by the various cascades is 3,500 tons per hour. To supply such a mass of water as this was a serious matter, especially as it was necessary to obtain a certain amount of pressure for the purposes of irrigation. The supply that could be obtained from the Seine was not only insufficient, but costly, as it had to be raised by steam power, and moreover the Seine water was then the only potable water in Paris. Recourse was therefore had to the canal of the Ourcq, the level of which is more than twenty feet higher than that of the lakes in the Bois; this source gave 18,000 tons in the twenty-four hours. An artesian well was sunk at Passy, and this now supplies from 9,000 to 10,000 tons in the same period; but the water is strongly impregnated with sulphuretted hydrogen, and can, therefore, scarcely be used for the alimentation of the lakes, which are well stocked with fish.

The total cost of the transformation of the Bois is given by M. Alphand as follows:—

Works, equal to	£298,953
Purchase of surrounding lands, &c.	275,126
Total	£574,079
Against which stands the proceeds of the sale of building plots and other receipts	£351,174
Leaving a balance of	£222,905

Another and very important fact is stated, namely, that whereas formerly the garden land around the Bois was only worth from 1s. 3d. to 5s. per square metre, it now fetches from 16s. to £4 per metre, while 487 mansions or villas have grown up around the Bois, whose construction is estimated to have cost, on an average, at least £8,000 each. The revenue derived in consequence in the form of direct and indirect taxation must certainly be considerable. The width of the roads in the Bois is one of its remarkable features; the principal of these are more than sixty feet broad, three quarters of which are given to the carriage-way; the secondary roads are fifty feet and thirty-three feet, and the smaller twenty-five feet wide. The margins of the footpaths are maintained by means of a mixture of the scrapings of the carriage-way to which they appertain with chopped hay or straw, and the system is said to answer well. Edgings of Portland cement moulded on the spot have lately been tried, but they cost more than two shillings the metre. The drainage of the Bois was a serious matter; the level is generally flat, and sewers throughout would have cost

about £160,000. The system of wells was therefore adopted, and these are placed at intervals of about 200 yards apart; these wells are capable of containing from ten to twenty tons of water, and are circular or rectangular in form according to circumstances. The methods of making the roads, the means employed, and the cost are given in full detail with great minuteness; the greatest economy was practised, so that the total cost only averaged about fourpence the square yard. Of the million square metres of roads and pathways in the Bois, more than half are macadamised, the rest are gravelled or merely beaten, the soil being, in general, very strong.

The conduits for water, the arrangement of the hydrants, and the modes of irrigation have been studied with great care, and the methods now in operation are remarkable for their efficiency and economy. Each carriage road has beneath it a conduit in which the pressure varies from fifty to a hundred feet, and minor branches conduct the water to every part of the park. The pipes used originally were of cast-iron, but all the new ones are made of sheet-iron and bitumen.

After experiments of several kinds the system of watering by means of carts has been entirely abandoned for that of jointed hose, with copper branches for the delivery of the water. The two engravings, figs. 1 and 2 (p. 848), show the apparatus in use, with the details, on an enlarged scale.

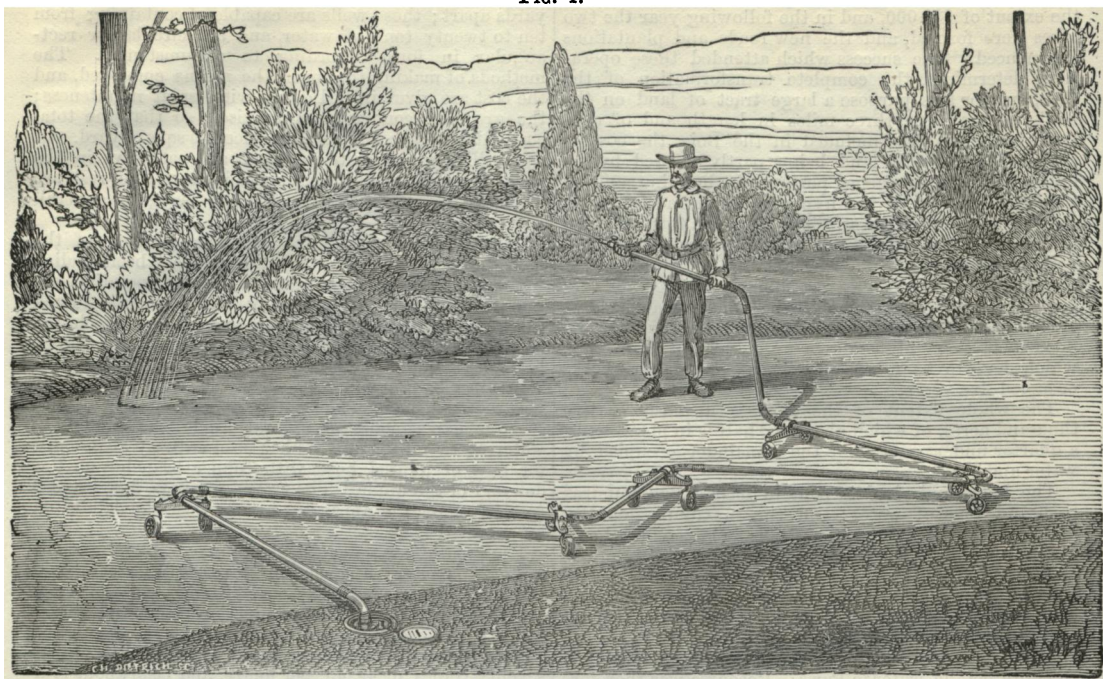
The apparatus is generally about forty feet long, and one inch in diameter; it consists of several tubes composed of plate iron, lined with lead and bitumen, and connected together by means of leather junction pieces and bronze screw joints, each tube having a small carriage with two rollers, as seen in the engraving. This apparatus costs seventy francs, or 4s. 4d. per metre, and lasts about four years. It is found in practice that a man cannot manage a longer apparatus, and, as it will throw the water in a circle of twenty-five metres radius, the hydrants are placed at intervals of from 30 to 40 metres apart. The diminution of the jet of water when the tube is lengthened is also very great. The copper branch is rather less than half an inch in interior diameter at the orifice, that being found to be the most effective in practice; and it is provided with a stop-cock, so that the water can be shut off instantaneously on the passing of vehicles.

By this method the watering of the Bois costs £2,200 per annum, while by the old system of carts it came to £8,400. The quantity of water distributed is about three quarts per square yard.

M. Cousté, director of the tobacco works of Paris, proposed a chemical method of laying the dust on the roads and pathways, which has been tried with some effect; it consists of sprinkling them with chloride of magnesium or sodium, or other deliquescent salt well calcined, the quantity of salt used being half a pound per square yard, and the cost a tenth of a penny. On broad, much-frequented roads, which require scraping every week, the cost of this system is found to be double that of water, but in other places, where the salt is left undisturbed, it has proved very economical. It also possesses the important recommendation of keeping footpaths clear both of mud and dust.

The watering of the grass, of which there are 252 acres in the Bois, is performed in a more simple manner than that of the roads; in small plots the branch of the hose is supported by an iron stand, which is moved from time to time, but large expanses are watered by means of jointed hose, like those already described, the place of the branch being occupied, however, by a screw plug, and each joint of the pipe being pierced with two holes in its side, at an angle of 45°; the rougher these holes are the better, the ragged orifice causing the water to be thrown over the grass in the form of fine spray. When requisite, two or more of these apparatus are joined together. With 300 yards of tube, shifted three times, one man can easily water 1,500 square yards per hour. The grass is only watered during four months in the

FIG. 1.



year, and the cost is not more than five guineas per acre. The length of the conduits and water-pipes in the Bois is 66,200 metres, and there are 385 stop-cocks, and 1,600 hydrants: the total cost of all these was £60,800, or at the rate of nearly seventeen shillings per yard.

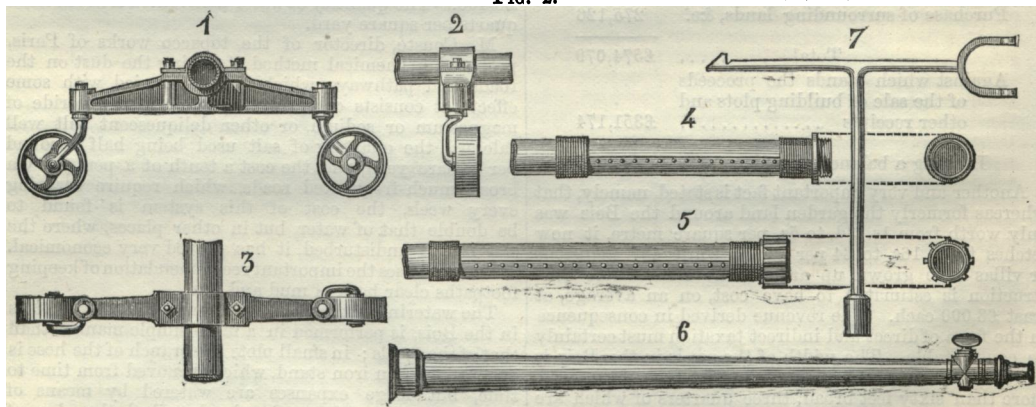
The surface of the two lakes, both artificial, is equal to 220,000 square metres; the great lake had to be completely lined with rubble stone and concrete, and the work cost £9,228.

There are several pretty cascades in the Bois, and a

grotto is formed beneath the great cascade of Longchamp. This cascade was formed on the site of an old quarry, advantage being taken of the irregularities of the ground; it has a main fall more than thirty feet wide, and nearly as high, and two minor falls, expending together 3,000 tons of water per hour. The cost of making this cascade was £6,400, the rocks used being brought from the picturesque forest of Fontainebleau.

The total cost of the lakes, rivulets, and cascades in the Bois was £38,780.

FIG. 2.



The history of the plantation of the Bois is told with complete details, including the transplanting of trees of all ages, with the cost of the operations, and the success achieved. The removal of trees is performed with the aid of carriages, fitted with windlasses, for lifting the tree when it has been isolated from the surrounding soil. These carriages are of three kinds, two being of wood and the largest of iron; they cost respectively £28, £44, and £340, and are all represented by engravings. The cost of transplanting a tree varies from one to five pounds.

The success of the operation varies not only with the quality of the soil, but also with the nature of the tree itself; in some cases the losses have amounted to more than two-thirds of the whole, while in others the success has been complete. Great attention has been given to these operations, and much useful information is afforded concerning the kinds of trees best adapted for transplanting, of which the horse-chestnut seems the most remarkable, and also respecting the method of conducting the removal, and the precautions necessary afterwards.

The number of trees and shrubs planted in the Bois since the commencement of its transformation is 420,000, and the total cost of the plantations more than twenty-five thousand pounds.

Amongst the wood-engravings intercalated in the text are a number of specimens of exotic trees that have been acclimatised, and used in the plantations of Paris.

The large plates are executed on steel, stone, or wood, according to the nature of the subjects, which include views of picturesque spots, plans of the Bois and other parks and gardens, views and sections of lodges and other structures, and details of iron-work, &c. In addition to these there is a series of large chromo-lithographic prints of foliage and other exotic plants, such as *Solanum warscewiczii*, *Colocasia bataviensis*, and *Wigandia vigierii*, beautifully drawn and executed. The printing of the work, by M. J. Claye, of Paris, is admirable.

Commerce.

AN AMERICAN VIEW OF THE COTTON QUESTION.—The *New York Tribune* says:—"A geographical fact of the greatest importance lies at the foundation of all just views on the question of the cotton supply. England believes that deeper ploughing, selecter seed, more diligent culture, nicer picking and marketing, will enable her to offset our South with her India. As to quantities, this may be; as to quality, never; and this is the reason: Cotton, as to the size of the plant and the number of pods it holds, depends upon richness of soil and solar heat. These England finds in sufficient perfection in the Ganges and on the table lands of Deccan. But as to the colour and oiliness of the seed, the fineness and length of its silken filaments, cotton varies in quality according to the mildness and evenness of the autumnal climate. Different regions in our sunny cotton belt differ in this respect, but the contrast is a mild one, and we have a great advantage over the whole of the East India peninsula. After July, our southern climate is, for the most part, rainless till late in the fall. This is caused by the high lands, which commence from one to two hundred miles from the sea-side, where the best cotton grows. Clouds loaded with moisture from the Gulf and the ocean off Florida are wafted northward, but do not discharge their contents till they reach the cool wooded slopes of the Cumberland and Alleghany mountains. This circumstance gives America her unequalled advantages as a producer of long cottons. In India, there is a small district where the conditions are somewhat similar, and rain-clouds in the picking season are attracted northwards across the lower portions of the Ganges Valley, to expend their waters upon the frigid slopes of the range that parts India from Thibet. Dacca is the central city of this region, and Dacca lawns have a romantic fame like that of Damascus blades. A study of the geographical conditions in India, as etched on any good map, will show how limited is the area to which England must be confined in her endeavour to grow such cottons as her finest looms demand. Vigilant and grasping as ever, she has been moving of late to secure that hereditary pet of all her policies, a monopoly. She proposes to do it by active and potent stimulants applied to cotton culture in the Ganges Valley, and the transporting facilities of that country. In Lancashire, the great seat of the cotton industry of the kingdom, there is at present no more cotton than will keep the mills going five days out of six, and there is a continual struggle among the manufacturers to obtain the cotton necessary to prevent a stoppage of the mills. Sad effects are showing themselves in the rapidly growing number of operatives thrown out of employment, and in the increase of pauperism. At a meeting, just held in London, of representatives of the cotton industry of the north of England, and of members of Parliament whose constituencies are interested in that industry, the conviction was generally

expressed by the speakers that Lancashire will have to look elsewhere than to this country, seeing that the Americans are using their cotton more and more largely themselves, and will consequently be able to spare less and less of it every year. Resolutions were passed, earnestly recommending the government to establish boards of agriculture in each presidency of India, with a view to the introduction of improved methods of cultivation, the proper selection of seeds, and the use of fertilisers; and also expressing the hope that the government will see the necessity of expending not less than fifty millions of dollars a year in extending the railway system of India, and meeting the requirements necessary for the agricultural development of the country. The movement is a pressure from the ghastly array of British pauperism upon meteorological facts that will be removed when the Alleghanies are emptied into the Gulf Stream. That same pressure of British pauperism it is that regularly pushed soft-headed legislators among us into low tariffs, and all the flounderings of the anti-protectionists. We are glad to see London flinging her doubloons against the eternal slopes of the Himalayas. That is their way of talking free-trade and practising protection. Still, it is proper to thank Lancashire for the lesson her vigilance affords, and we should better the instruction. A million hungry faces are turned to her imploringly, and begging of her mighty combiners, whether merchants or ministers, to explore the last tropical valley that roasts under a torrid sky before they give up the hope of keeping every spindle whirling. We have more coal than she, more waterfalls, more food, more acres suited to the growth of first-class cotton than she can find, though she search creation round, or fly from pole to pole. If the dark exigencies of her giant problems spur England to a restless national thrift, cannot we see that a wise forecast calls upon us to set up a breakwater against her pauper-made goods, that millions of bales of our upland cotton may sing the song of home industry on millions of American spindles?"

Colonies.

GOLD.—It was officially reported on the 1st July that a very rich gold-field had been discovered at Trunkey Creek, which lies in the west, about 38 miles from Bathurst and 16 from Careoar. The field is described as consisting of auriferous quartz reefs, in which the precious metal is very abundant. These reefs have been marked off for six miles, and fresh discoveries in the vicinity are reported daily. The district is mountainous for many miles round, and, besides bearing gold, has silver, copper, iron, marble, and limestone. It is also a pure agricultural country. All the gold-bearing reefs run north and south, and dip slightly to the west. A report is current to the effect that there are already 300 people on the ground, and the whole neighbourhood is in a ferment.

EMPLOYMENT.—The *Melbourne Age* states that the presence of distressed colonists abroad is a matter which affects this as well as others of the Australian group. From the governments of Madras and Bengal communications have been received, stating that many Australian colonists who had gone to the East Indies as grooms in charge of horses, have there fallen into great distress, there being no new avenue for their employment, and their first occupation being gone. As this is likely to lead to false impressions, of Victoria at all events, it is desirable to explain that the sufferers owe their misfortunes to their choice of a pursuit and neglect of securing an engagement. There is no ground for their leaving the colony on the score of lack of employment. Instead of sending forth any of our population as a surplus, we are ready to give a hearty Australian welcome to as many honest, thrifty, industrious immigrants as are willing to aid in the utilisation of a fair and fertile territory, rich in

almost every resource that could stimulate enterprise. It is no exaggeration to say that when the new Land Bill becomes law, there will be facilities for agricultural settlement on our soil which, taken for all, are preferable to those presented in any other portion of her Majesty's dominions. New manufactures are springing up all over the country, furnishing employment for skilled labour; and although the days of impromptu fortune-making on the diggings are gone, the discoveries continually being made serve to show that our goldfields will retain their reputation for years. The wealth of Australian precious stones has never been adequately tested, although sapphires, rubies, diamonds, and other valuable gems have been found over and over again. Very recently, some fine stones have been found in the Ballarat district, and in Araluen, New South Wales, discoveries of diamonds have been made, and are being made, which apparently promise to secure for that locality a real reputation. The Australian Diamond Mine Company is certainly the rage among recent speculators.

Notes.

RAILWAYS AND CANALS IN SPAIN.—At the beginning of 1867, there were 5,110 kils. of railway opened in Spain, which, during the previous year, carried 10,962,866 passengers. The net receipts of these lines, in 1866, amounted to 143,814,402 reals (£1,498,066). 1,887 kils. of railway, in addition to the above-mentioned 5,110 kils., are to be opened by the end of 1867, making a total of 6,977 kils. The total cost of this network will, when complete, amount to 607,848,512 escudi (£65,850,255), towards which the government give subventions to the amount of 183,228,315 escudi (£19,849,735). The roads are 16,065 kils. in length, of which 5,976 kils. have been made since 1858. There are now about 2,918 kils. of roads in construction, 6,640 projected, and 2,325 being surveyed. There are 1,277 kils. of navigable rivers, of which 481 kils. are navigable throughout the year, and 796 for only certain seasons. The inland river navigation is carried on by 26 steam-vessels, of 1,534 united horse-power, 1,157 row-boats, and 330 tow-boats. There are also 212 kils. of navigable canals, with 332 canal boats. The number of telegraph stations in Spain is 164, and, in 1866, there were sent 606,596 inland and 59,866 international dispatches for private individuals, and 118,635 inland and 4,121 international dispatches on public service.

CANALS IN PRUSSIA.—A canal is projected, destined to connect the cities of Berlin and Dresden, so as to compete with the railways in the conveyance of heavy goods and merchandise, which could not, from their low price and bulk, afford a high rate of freight. There is at the present time a very round-about water route between these two places, and the barges plying on it are chiefly laden with coals and sandstones from Saxony, as also, to a large extent, with fruit from Bohemia; the journey occupies on the average three weeks. The proposed canal would shorten the journey to only four days. It will leave the Elbe a little below Dresden, and will enter the Spree just above Berlin, being a distance of about a hundred miles. The projectors depend for the success of their scheme mainly on the hope that, in their case, the government will allow steam to be used; the law in Prussia forbidding the use of screw or paddle wheels on all canals, on account of the destruction to the banks by the wash of the water.

THE AUSTRIAN LLOYDS' STEAM NAVIGATION COMPANY.—The fleet of the Austrian Lloyds' Steam Navigation Company, at the end of 1868, consisted of 69 steam-vessels, of an aggregate tonnage of 62,220, and of 15,800 horse-power, and at the present time the total number of vessels has been increased to 73, with a tonnage of 70,000. The profits of the past year amounted to 2,103,600 florins.

Patents.

From Commissioners of Patents' Journal, September 24.

GRANTS OF PROVISIONAL PROTECTION.

Agricultural drills, &c.—2662—W. N. Nicholson and G. Black.
Boots and shoes—2465—E. T. Hughes.
Butter, &c., clarifying and refining—2565—W. Young.
Carriage doors—2548—J. Fion and W. Charlet.
Carts, &c.—2656—W. T. Lillierap.
Ceramic or plastic materials, apparatus for moulding articles in—2670—J. G. Tongue.
Coffee, &c., machinery for hulling and polishing—2011—A. Angell.
Drilling machinery—2555—J. Spencer and J. Consterdine.
Electric signals, instruments for transmitting and recording—2525—O. and F. H. Varley.
Fires, apparatus for extinguishing—2664—W. R. Lake.
Hurdles for folds for lambs and sheep—2436—J. B. Rushbrook.
Jacquard machines—2668—J. E. Moorhead and W. Dudgeon.
Keyhole guides—2636—R. E. Hodges.
Life-buoys—2369—J. T. Greenfield.
Liquids, &c., measuring and registering the flow of—2648—J. A. Muller.
Locks and latches—2672—M. Andrew.
Millstones, machine for dressing—2646—A. M. Clark.
Motive-power, apparatus for transmitting—2660—P. Hall.
Mules for spinning—2640—S. Oddy and R. Nuttall.
Portraits, &c., box for enclosing—1638—H. A. Bonneville.
Printing surfaces, apparatus for producing—2658—D. Colville.
Railway rails—2650—W. Palliser.
Railways—2674—S. Fox.
Screw propellers—2644—C. H. Murray.
Steam, &c., indicating and registering the pressure of—2587—B. Isangk.
Tobacco pipes, &c., filling—2583—S. Schiff.
Velocipedes, &c.—2489—W. Longbottom and A. Willan.
Velocipedes, &c., bearings of loose axles for—2652—F. Forder and J. Traves.
Washers for fastening metal nuts—2515—F. Oakley.
Watch protectors—2642—K. Kraus.
Windmills—2602—H. Henchman.
Wire, machinery for drawing fine—2666—S. Simpson.
Wounds, &c., means for protecting—2654—A. H. Gilmore.

INVENTION WITH COMPLETE SPECIFICATION FILED.

Spinning frames, spindles and filers of—2745—W. R. Lak.

From Commissioners of Patents' Journal, September 28.

PATENTS SEALED.

937. F. B. Taylor.	1122. A. d'Azambuja.
954. A. Barclay.	1131. B. J. B. Mills.
956. T. E. Williams.	1134. J. H. Johnson.
959. T. G. Webb.	1140. J. Leechman.
967. A. F. Baird.	1160. B. W. Farey.
971. H. Davey.	1166. F. J. Bramwell.
976. J. Livesey.	1188. T. Amies.
978. R. Jones.	1326. E. Crowe.
979. W. E. Gedge.	1465. T. Bullivant.
982. J. C. Lee.	1539. W. R. Lake.
983. C. Lange.	1708. C. Francis.
986. G. Holcroft & W. N. Dack.	1867. W. E. Newton.
987. E. O'Connell.	1890. E. H. C. Monekton.
991. J. Caplin.	1914. R. Moreland, jun., and D. Thomson.
995. W. Bayne and O. E. Mac Gregor.	1928. J. Brooke and J. Hirst.
996. G. H. Smith.	1946. A. Clark.
1000. F. Schäfer.	1956. J. Howard.
1402. W. Y. Craig & S. P. Bidder.	2065. T. James.
1003. D. Osborn.	2075. J. Walker and P. A. Godefroy.
1006. M. Wolfsky.	2136. J. J. Cousins.
1012. U. Scott.	2267. H. A. Bonneville.
1071. D. and G. Hallas.	2288. H. A. Bonneville.
1072. J. A. Chaufourier.	2368. W. R. Lake.
1121. E. Beanes.	

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

2410. G. and E. Ashworth.	2483. H. A. Bonneville.
2420. J. W. Morgan.	2545. E. Mortimer.
2419. G. O. Gooday.	2561. W. E. Newton.
2425. W. Clark.	2465. A. Steven.
2448. T. Whitaker and J. Constantine.	2522. J. Whitworth.
2502. J. H. Dallmeyer.	2479. J. C. Sellars.
2454. J. and A. Gamgee.	2480. H. A. Bonneville.
2468. W. E. Newton.	2491. W. Clark.
2470. G. E. Van Derburgh.	2593. G. T. Bousfield.
	2680. H. Kessler.

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

2633. H. Hutchinson.	2613. T. Kennedy.
2653. J. L. Hughes.	